



Artificial Intelligence tools for IP Admin

Powered by WIPO AI

Q2, 2020

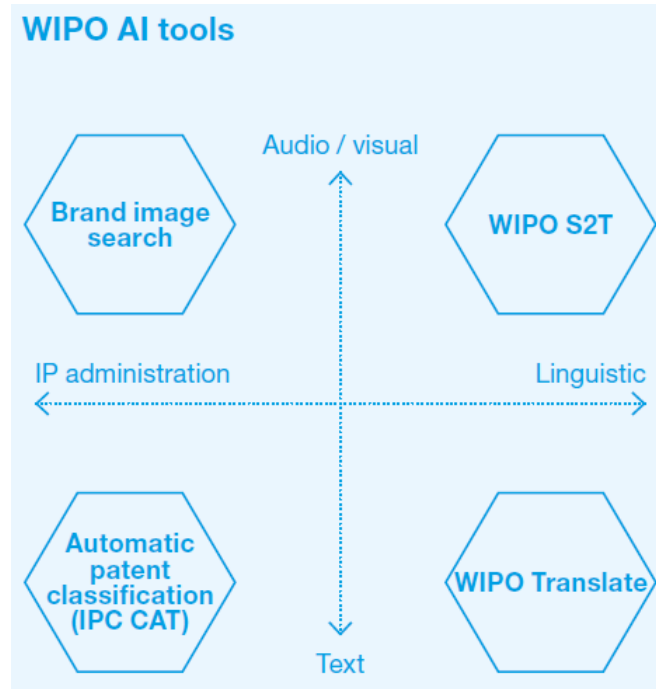
Agenda

1. A brief history of Artificial Intelligence (AI) at WIPO
2. Executive summary of AI projects at WIPO (active and under R&D)
3. Focus on:
 - [WIPO Translate](#) for patents (and other domains)
 - [WIPO Image Similarity Search](#) for trademarks
 - [WIPO International Patent Classification auto-classifier](#) for patent abstracts (and other)
 - [WIPO Speech-to-Text](#) for meetings and conferences
4. Expanding WIPO's AI footprint externally

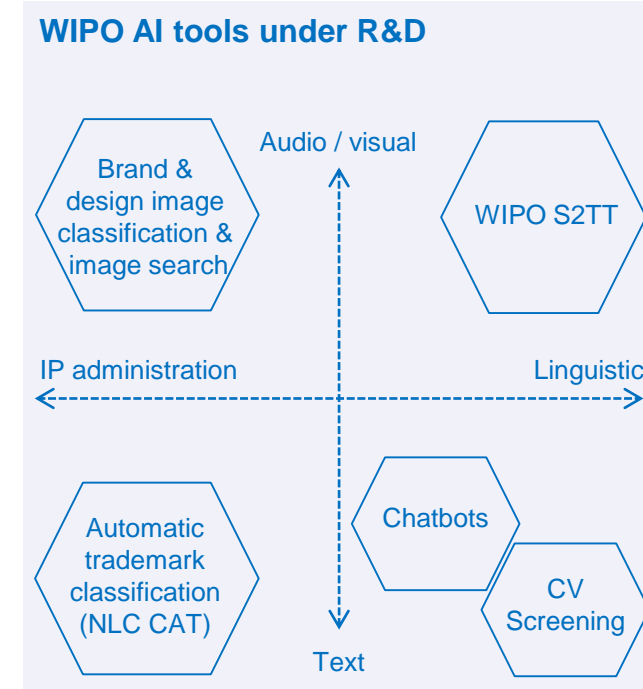
History of “deep supervised” machine learning at WIPO

- As data generated and collected by WIPO increases, so must our effectiveness in driving value from data – AI plays an important role!
- Launched a statistical machine translation (SMT) tool, TAPTA, in 2011 due to increasing translation needs across our systems and divisions
- Launched a neural machine translation (NMT) tool, WIPO Translate, in 2016 to improve quality (only 5 days after Google’s first NMT release)
- Since 2016, further use of AI in image similarity, language processing, and other, gradually transformed WIPO into a strong AI market player

Executive summary of active WIPO AI development



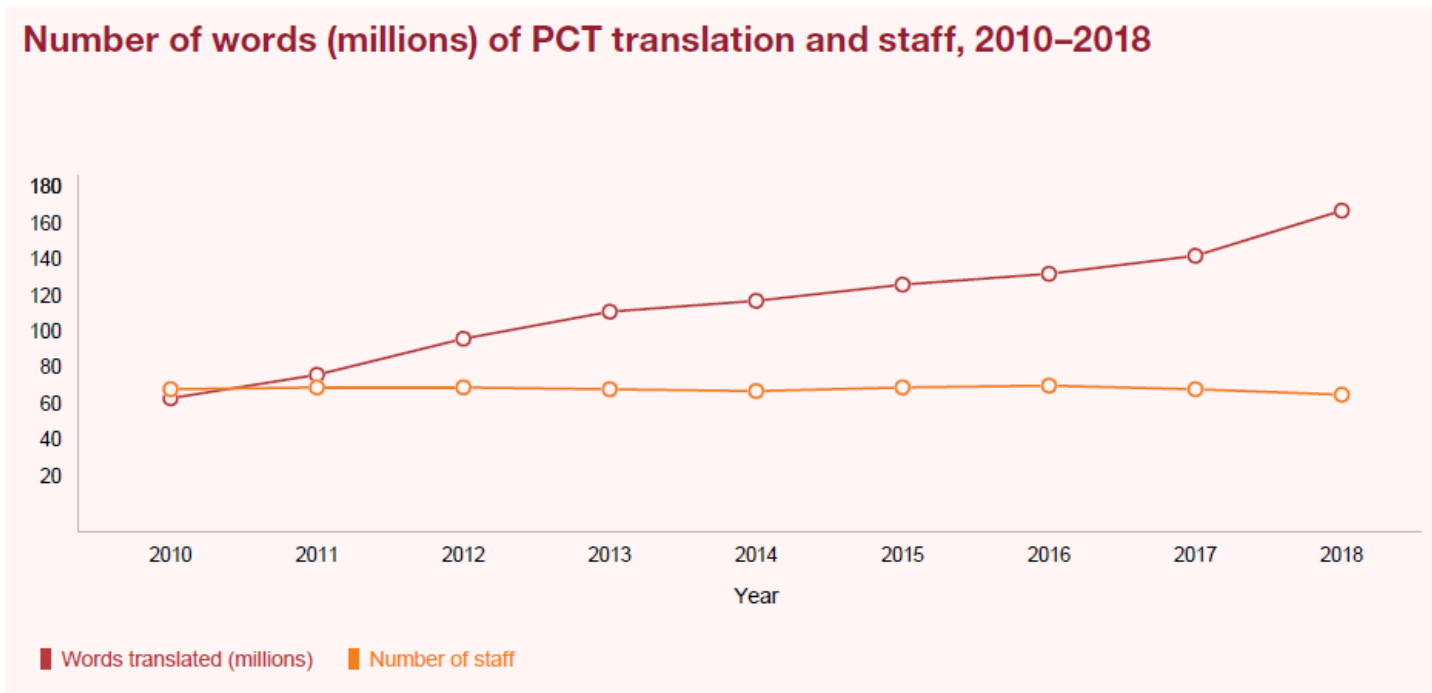
- Image similarity search for TMs
- NMT Translate and Speech-to-Text (S2T)
- IPC text classification (IPC CAT)



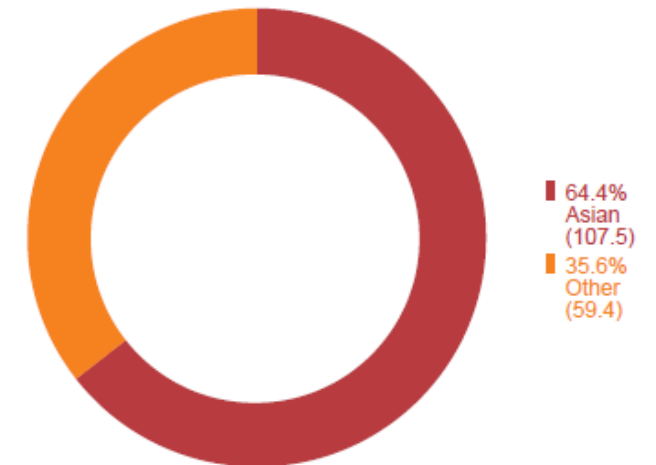
- Vienna classifier and design image search
- Speech-to-translated-Text (S2TT)
- Nice text classification (NLC CAT)
- Other similarity

WIPO Translate for the Patent Cooperation Treaty (PCT)

- WIPO MT tools* for PCT have processed >1 billion words of patent text

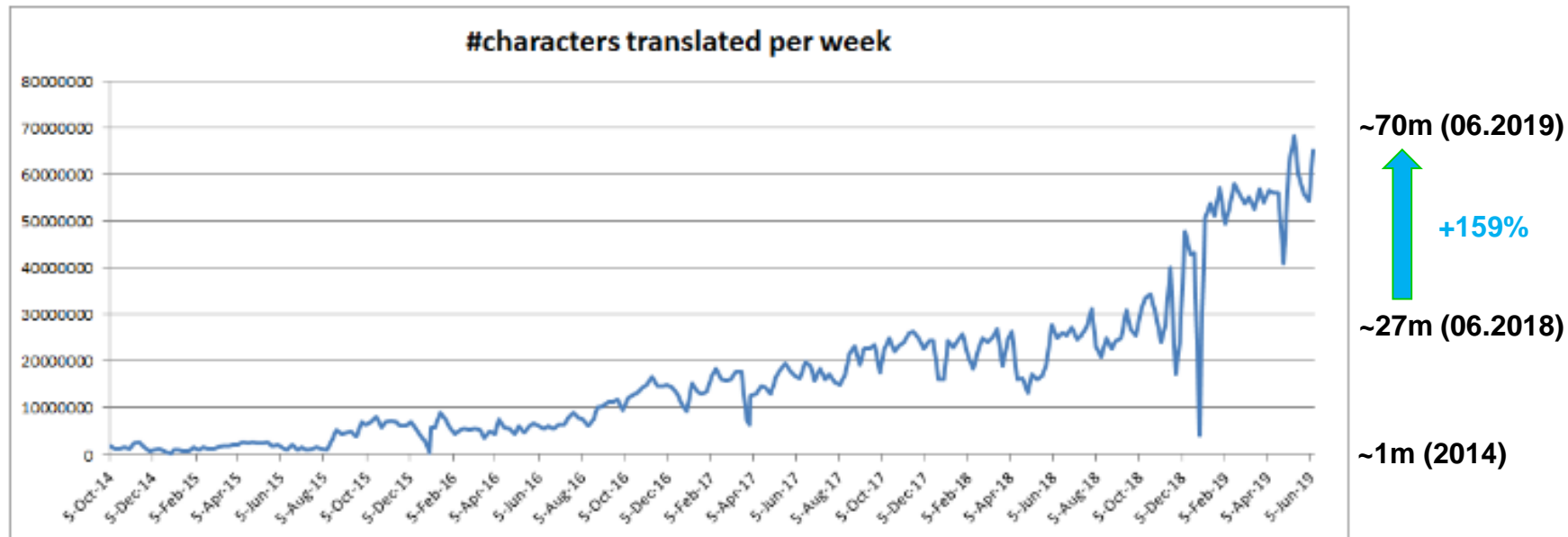


Distribution of words (millions) translated by the International Bureau, 2018



*WIPO's Statistical Machine Translation tool (Tapta) launched in 2011. WIPO Translate (Neutral Machine Translation tool) launched in 2016.
Source: Report of the Director General to the 2019 WIPO Assemblies

WIPO Translate for PATENTSCOPE



- An estimated 8b characters were translated in 2018 alone
- Daily volumes reached 3m words translated / day at the beginning of 2020
- 65 % Chinese, Japanese and Korean

WIPO Translate: Key information

- WIPO Translate is founded on in-house software but using MarianNMT¹ open source tech
- Can outperform other tools, including market leading NMT-based commercial services
- Key strengths:
 - WIPO data-driven approach*: highly trained on large volumes of IP-related text
 - Care in customization of the engine to suit specific domain
- Currently being adapted to numerous non-IP domains (e.g., for use by other UN organizations)

[>> Try WIPO Translate for yourself <<](#)

¹ <https://marian-nmt.github.io/>

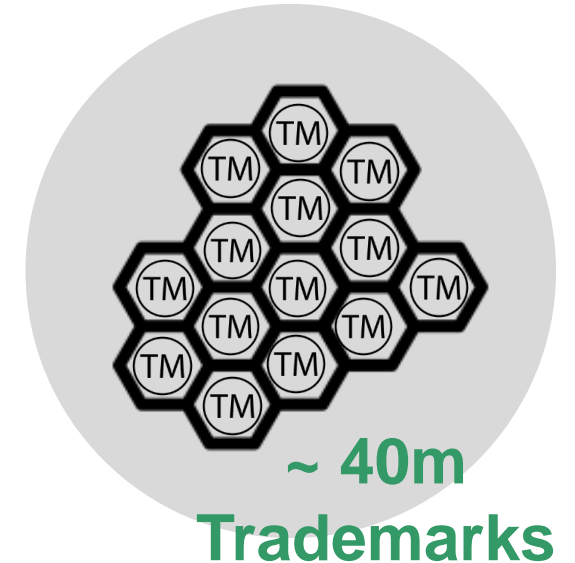
* See Appendix for more details

Image similarity search for TMs – Global Brand Database



Choose a strategy:

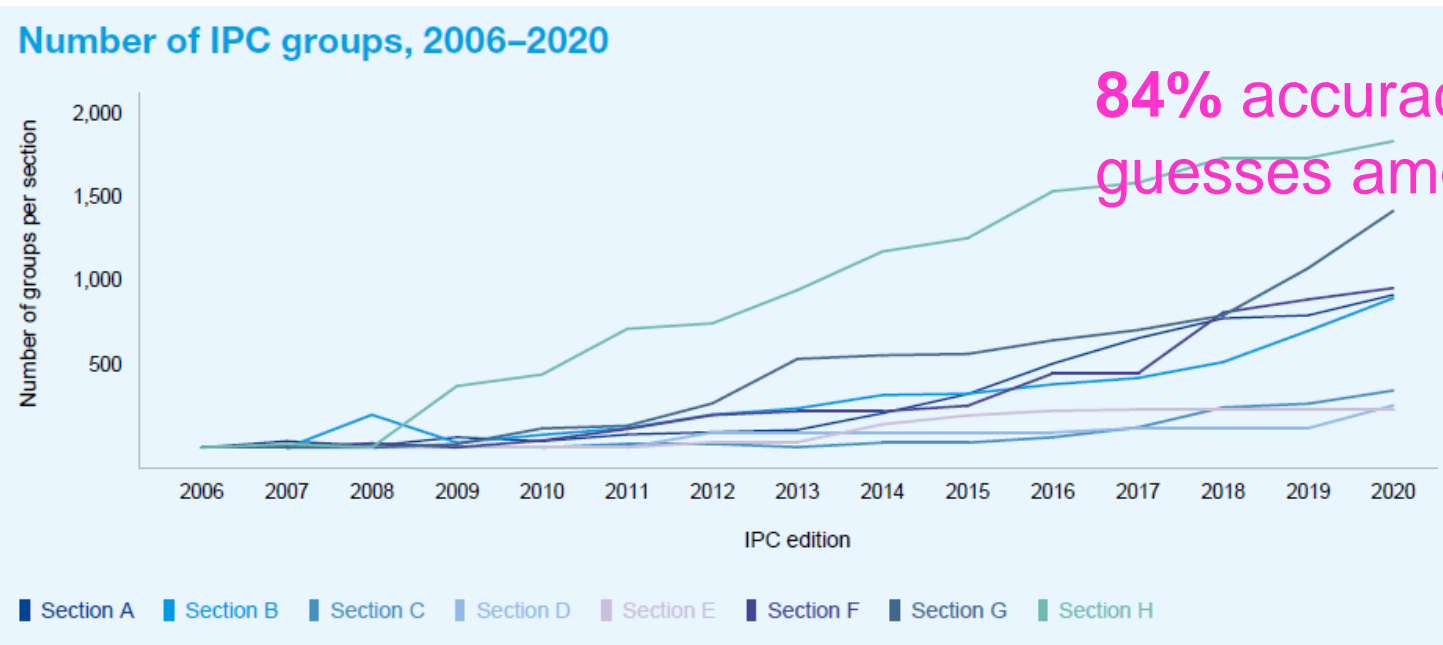
1. Concept
2. Shape
3. Colour
4. Composite



- Best-in-class AI algorithm developed and deployed in April 2019
- > 6,000 image-based searches per month
- API is available for licensing purposes

[>> Try the search tool for yourself <<](#)

Automatically assigning IPC classes to patents (IPCCAT)



- IPCCAT-neural is WIPO's AI-based automated text classification tool;
- Automatic IPC classification at subgroup level (support of 10 languages);
- Other uses: Classify science & tech related documentation

WIPO Speech-to-Text: Audio/Video transcription tool

- Content aligned with text
- In-tool text editing
- Powerful search tool in multiple languages
- Can be combined with WIPO Translate



Set playback speed: 2x 1.5x 1x

in the pre-grant and post-grant review, effective barriers and prevent patent-based incentives and necessity

With the drilling force for triggering drug research and development developing countries.

The TRIPS Agreement provides these countries with policy space.

WIPO Speech-to-Text search

trips English SCP31

Search WIPO meeting transcripts

Search results

Text snippet result	Conference	Date	Media timestamp
The TRIPS Agreement provides these countries with policy space.	SCP31	2019-12-02	56 minutes, 20 seconds
In spite of different national laws the flexibilities enshrined in the TRIPS Agreement.	SCP31	2019-12-02	2 hours, 16 minutes, 23 seconds
And especially LDCs on the understanding and use of flexibilities contained in the TRIPS Agreement.	SCP31	2019-12-02	2 hours, 31 minutes, 44 seconds
The effective use of compulsory licensing within TRIPS flexibilities has.	SCP31	2019-12-02	2 hours, 42 minutes, 57 seconds
TRIPS flexibilities.	SCP31	2019-12-02	2 hours, 31 minutes, 59 seconds
Of the TRIPS Agreement which is already in force in Brazil and this will be until Thirty first December	SCP31	2019-12-02	2 hours, 38 minutes, 7 seconds
And the mechanisms and the use of the flexible possibilities of the patent system are set out in TRIPS	SCP31	2019-12-02	23 minutes, 33 seconds
The major international patent instruments including the Paris Convention and the third TRIPS Agreement	SCP31	2019-12-02	2 hours, 30 minutes, 28 seconds
We find that this particular exception should be used within the rules provided in the TRIPS Agreement	SCP31	2019-12-02	2 hours, 37 minutes, 36 seconds
The significance of TRIPS flexibilities in the design of domestic patent laws is critical and provides	SCP31	2019-12-02	54 minutes, 47 seconds

WIPO Speech-to-Text: Key information

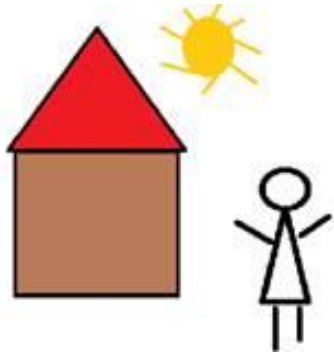
- An example of machine learning in-house development based on WIPO conferences
- Currently in production at WIPO for two conference series, but will likely replace human transcription of all WIPO meetings by 2021
- Saves significant budget in producing and translating verbatim records
- Key strengths:
 - WIPO data-driven approach*: highly trained on large volumes of IP-related text
 - Exceptional at accurately transcribing heavily accented English accents
- Currently being adapted and licensed to numerous international organizations and institutions

[>> See WIPO S2T in action <<](#)

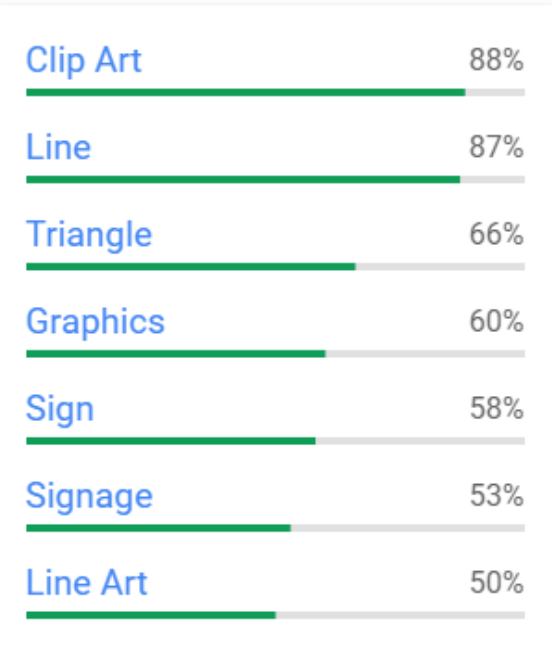
* See Appendix for more details

How does WIPO AI compare to industry standard?

- WIPO AI algorithms can be more accurate than typical commercial services (e.g., image classification)



Google Vision AI “Labels”



WIPO’s image classification tool

07.01.04	Detached house	12.891
07.01.06	Other stylized houses	11.684
01.05.04	Suns with rays	11.08
04.07.03	Geometric figures or combinations of geometric figures representing a person	10.558
01.05.25	Other representations of the sun	10.538
02.05.02	Silhouettes or profiles of children	9.63

Expanding WIPO's AI footprint externally

- WIPO is mindful of the growing global digital divide and thus committed to providing inclusive access to WIPO AI tools
- WIPO is licensing its AI tools on reasonable terms in order to recover investment and operating costs (e.g., Science & Tech community and other UN organizations)
- As-of April 2020, WIPO AI tools have been licensed to 17 different external entities and 31 more are in active negotiation and discussion



THANK YOU!

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Artificial Intelligence tools for IP Admin
Powered by WIPO AI

Appendix

1. 1-sliders for WIPO Translate and Speech-to-Text
2. WIPO data-driven approach
3. Key use cases for WIPO Speech-to-Text

WIPO Translate: Neural Machine Translation tool

- Developed in-house, using MarianNMT¹ open source
- Translates text, full docs, and includes online widgets and CAT tool plug-ins
- Different “out-of-box” domain versions available: e.g., UN verbatim & patents
- Each version has processed billions of characters of text, so highly refined
- Consistently outperforms market leading NMT-based commercial services
- Key strengths:
 - Translation of science and technology related text and documents
 - WIPO data-driven approach: highly trained on large volumes of IP-related text
 - Care in customization of the engine to suit specific domains
- Customized and licensed to numerous international organizations and institutions

[>> Try WIPO Translate <<](#)

WIPO Speech-to-Text: Audio/Video transcription tool

- Developed in-house, based on WIPO conference and meeting data
- WIPO pilot, but will likely replace conference transcription at WIPO by 2021
- Audio/Video aligned with text; in-tool multilingual full text search and editing
- Key strengths:
 - Speed: processes 1 hour of audio/video in 5 minutes
 - WIPO data-driven approach: highly trained on large volumes of IP-related text
 - Exceptional at accurately transcribing heavily accented English accents
- Customized and licensed to numerous international organizations and institutions
- Under R&D: Live captioning and full integration with WIPO Translate (immediate generation of multi-lingual versions of original language)

[>> See WIPO S2T in action <<](#)

WIPO data driven-approach

- AI should involve deep “supervised” machine learning where human expertise and intervention is key – Data quality forms the basis of WIPO’s approach
- Data volume is also key: AI does not learn and improve without a lot of data
- WIPO’s powerful GPUs: Large data sets require significant processing power
- Regular training (at least once / year) or “maintenance” is important at WIPO
- Domain focus: Training using partner data has many benefits, and WIPO’s team are experts at customizing software instances
- WIPO targets quick wins whilst accepting fast failure – iterative approach
- Aiming for 100% accuracy is not a sustainable strategy and can waste time and effort – WIPO still adheres to the highest of KPIs

WIPO Speech-to-Text: Use cases

- Quick meeting records delivery
- Archived knowledge discovery (through Search feature)
- Improving accessibility to content (closed captioning)